



**THE DATASHEET OF  
SBR3A40SA-13-F**



**Product Summary** (@  $T_A = +25^\circ\text{C}$ )

$V_{RRM}$ (V)	$I_O$ (A)	$V_{F(MAX)}$ (mV)	$I_{R(MAX)}$ ( $\mu\text{A}$ )
40	3	500	400

**Features and Benefits**

- Low Leakage Current
- Patented Super Barrier Rectifier Technology
- Soft, Fast Switching Capability
- +150°C Operating Junction Temperature
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

**Applications**

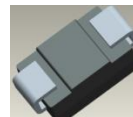
- SMPS
- AC-DC
- DC-DC Converter
- Freewheeling Diodes

**Mechanical Data**

- Case: SMA
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish.) Solderable per MIL-STD-202, Method 208  $\text{\textcircled{3}}$
- Polarity Indicator: Cathode Band
- Weight: 0.064 grams (Approximate)



Top View

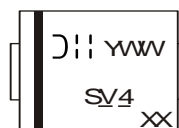


Bottom View

**Ordering Information** (Note 5)

Part Number	Compliance	Case	Packaging
SBR3A40SA-13	Commercial	SMA	5,000/Tape & Reel
SBR3A40SAQ-13	Automotive	SMA	5,000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**


- SV 4 = Product Type Marking Code  
 J11 = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 7 for 2007)  
 WW = Week Code 01 to 52  
 XX = Foundry and Assembly Site

Note: 6. Device has a cathode band (as shown above) and may also have a cathode notch.

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load  
For capacitance load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	40	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>RM</sub>		
Maximum Voltage Rate of Change (Rated V <sub>R</sub> )	dv/dt	10,000	V/μs
RMS Reverse Voltage	V <sub>R(RMS)</sub>	28	V
Average Rectified Output Current	I <sub>O</sub>	3	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	45	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance	R <sub>θJS</sub>	5	°C/W
Thermal Resistance Junction to Soldering (Note 7)	R <sub>θJA</sub>	124	
Thermal Resistance Junction to Ambient (Note 8)	R <sub>θJC</sub>	14.3	
Thermal Resistance Junction to Case (Note 8)			
Power Dissipation (Note 8) @T <sub>A</sub> = +25°C	P <sub>D</sub>	1.2	W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 9)	V <sub>(BR)R</sub>	40	–	–	V	I <sub>R</sub> = 0.4mA
Forward Voltage Drop	V <sub>F</sub>	–	0.30	0.35	V	I <sub>F</sub> = 0.5A, T <sub>J</sub> = +25°C
			0.33	0.38		I <sub>F</sub> = 1.0A, T <sub>J</sub> = +25°C
			0.43	0.50		I <sub>F</sub> = 3.0A, T <sub>J</sub> = +25°C
			–	0.48		I <sub>F</sub> = 3.0A, T <sub>J</sub> = +125°C
Leakage Current (Note 9)	I <sub>R</sub>	–	45	250	μA	V <sub>R</sub> = 5V, T <sub>J</sub> = +25°C
			80	400	μA	V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C
			9	40	mA	V <sub>R</sub> = 40V, T <sub>J</sub> = +125°C

- Notes:
7. Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB cathode tab solder junction.
  8. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  9. Short duration pulse test used to minimize self-heating effect.
  10. FR-4 PCB, 2 oz. Copper, single side 16 x MRP, 1" x 1" PC Board.

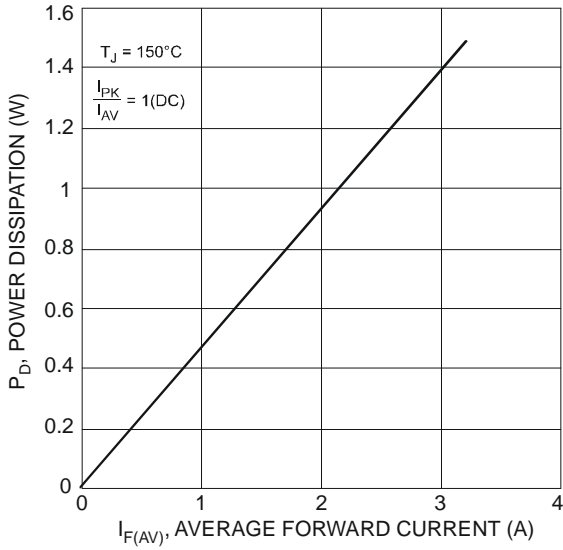


Fig. 1 Forward Power Dissipation

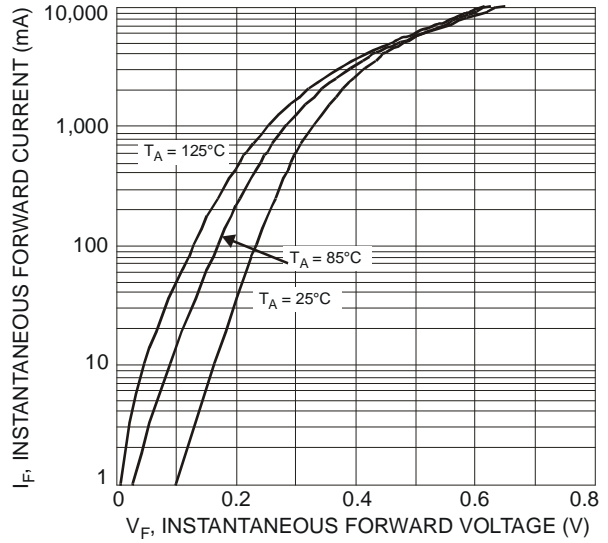


Fig. 2 Typical Forward Characteristics

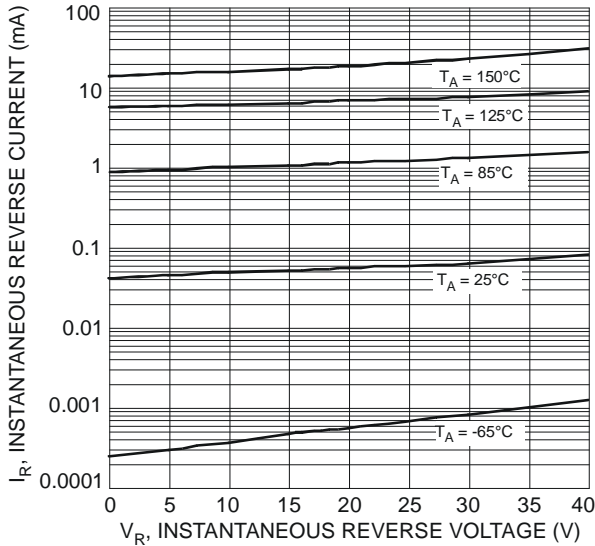


Fig. 3 Typical Reverse Characteristics

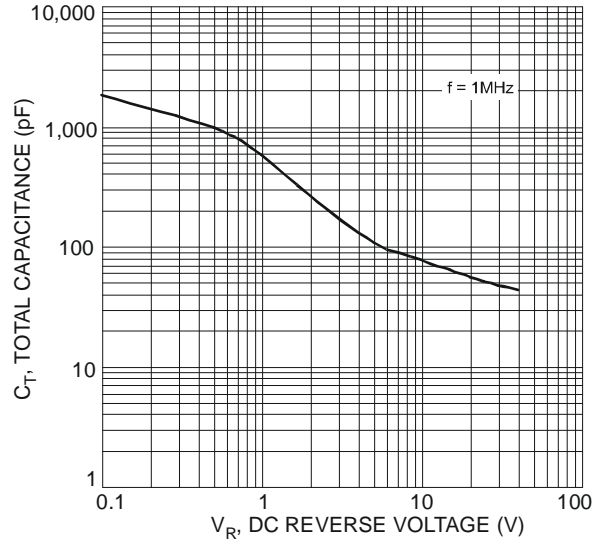


Fig. 4 Total Capacitance vs. Reverse Voltage

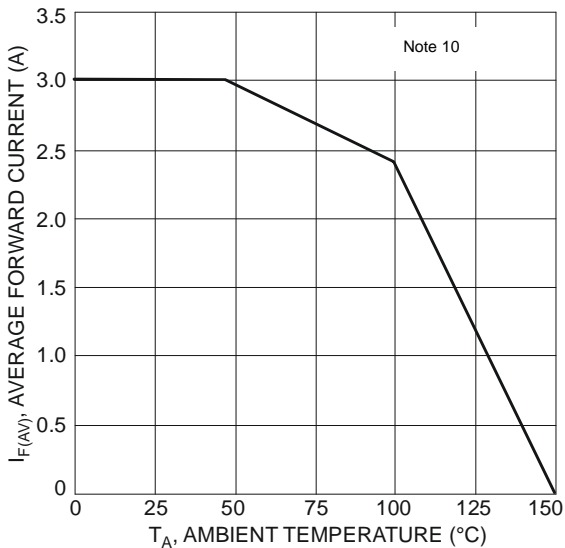


Fig. 5 Forward Current Derating Curve

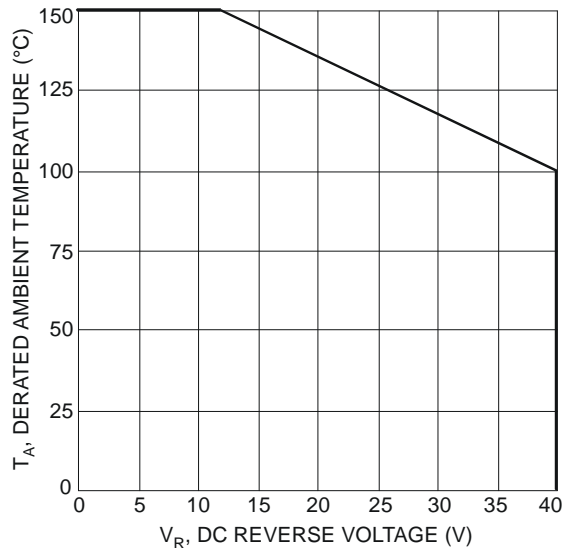
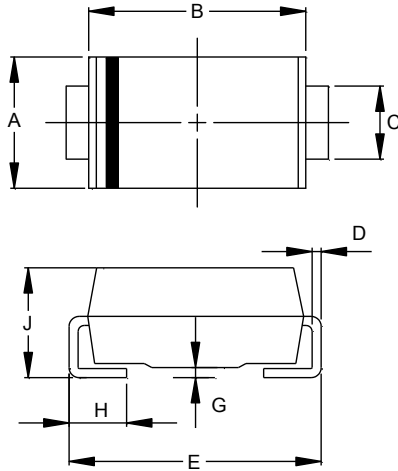


Fig. 6 Operating Temperature Derating

## Package Outline Dimensions

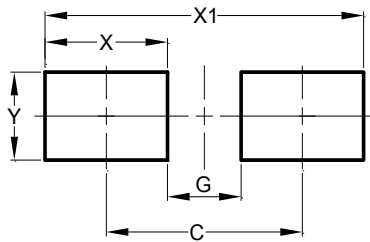
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



SMA		
Dim	Min	Max
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.05	0.20
H	0.76	1.52
J	1.96	2.40
All Dimensions in mm		

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



Dimensions	Value (in mm)
C	4.00
G	1.50
X	2.50
X1	6.50
Y	1.70

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